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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/661,752

Filing Date: September 12, 2003

Appellant(s): HANKS, DARWIN MITCHEL

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Jack H. McKinney  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed April 25th, 2008 appealing from the Office action mailed January 25th, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1-5, 9, 11, 13-18, 23, 25-29, 34-39, 43, and 45-48.

Claims 6-8, 10, 12, 19-22, 24, 30-33, 40-42, and 44 have been canceled.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5808983	Tsutsui et al.	09-1998
2002/0105865	Kusumoto et al.	08-2002
5742573	Hajjar et al.	04-1998
5477333	Shoda et al.	12-1995
2002/0089906	Faucett	07-2002
5,164,932	Fennema	11-1992

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 5,808,983) in view of Kusumoto et al. (US 2002/0105865).

Regarding claim 45:

Tsutsui discloses:

A system for establishing a baseline signal for application to an actuator within an optical disk drive to focus optics on an optical disk within the optical disk drive (abstract:

Tsutsui refers to the baseline position as the "optimum focus offset position;" that it involves a signal is shown by, for example, column 1, lines 59-65), the system comprising a baseline actuator positioning routine configured to:

- apply actuator control signals to the actuator to step the actuator through a full range of focus (column 10, lines 34-50);

- obtain an RF signal at each step (column 14, lines 25-45; Fig. 7);

- identify one of the obtained RF signals (column 10, lines 34-50); and

- set the baseline actuator control signal according to an applied actuator control signal which resulted in the identified one of the obtained RF signals (column 14, lines 50-65: "an optimum point can be...set").

Tsutsui does not disclose:

Wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

Kusumoto discloses:

An RF signal wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors (paragraph 72).

It would have been obvious to one of ordinary skill in the art to include in Tsutsui wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

The rationale is as follows:

Tsutsui discloses measuring the RF signal but does not disclose how the RF signal is obtained. Obtaining the RF signal is necessary for implementing the system of

Tsutsui. Kusumoto discloses a means of obtaining an RF signal: it's obvious to combine these teachings in order to implement Tsutsui's system, because one of ordinary skill could have combined them with predictable results.

Regarding claim 46:

Tsutsui discloses (Fig. 12) a control circuit 17: this is a processor-readable medium comprising processor-executable instructions for focusing optics. All other limitations positively recited have already been discussed with regards to claim 45.

Regarding claim 47:

This is a method claim corresponding to claim 45. This claim is met when the system of Tsutsui operates.

Regarding claim 48:

This claim is similar to claim 45 and is similarly rejected, as Tsutsui discloses means to implement the system of Tsutsui (for example, Fig. 12).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui in view of Kusumoto, and further in view of Fennema (US 5,164,932).

Tsutsui in view of Kusumoto discloses a system as discussed in the rejection of claim 45 above.

Tsutsui in view of Kusumoto does not disclose "wherein the baseline actuator positioning routine is configured to set the baseline actuator control signal to approximately 75% of the actuator control signal which resulted in the maximum of the obtained SUM signals."

Instead, Tsutsui in view of Kusumoto sets it to the signal which resulted in the maximum, as discussed above.

Fennema discloses that a baseline actuator positioning routine should be configured to set the baseline actuator control signal to approximately 75% of the actuator control signal which resulted in the maximum of the obtained SUM signals (Fennema gives the reasons in, for example, column 1, lines 58-67; the "approximately 75%" value is apparent from Fig. 3, where points 36 and 37 are the desired SUM signal, or readback signal, levels).

It would have been obvious to one of ordinary skill at the time of the invention to include in Tsutsui in view of Kusumoto wherein the baseline actuator positioning routine is configured to set the baseline actuator control signal to approximately 75% of the actuator control signal which resulted in the maximum of the obtained SUM signals.

The motivation would have been eliminate the problem disclosed by Fennema (column 1, lines 58-67): a point at the maximum level has a negative effect in the case of slight defocusing, whereas a lower point does not.

Claims 1, 4, 5, 11, 14, 17, 18, 23, 25, 28, 29, 35, 38, 39, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajjar et al. (US 5,742,573) in view of Tsutsui, and further in view of Kusumoto.

Regarding claim 1:

Hajjar discloses a system for establishing a baseline signal for application to an actuator within an optical disk drive to focus optics on an optical disk within the optical disk drive (abstract), the system comprising:

an error term generator configured to generate an error term (column 5, lines 1-11, where the details are similar to column 4, lines 15-18);

an adaptation coefficient configured to regulate a rate at which the error term modifies an actuator control signal (column 5, lines 1-11, where the details are similar to column 4, lines 53-57: if the feedforward signal is averaged with previous iterations there must be a coefficient configured to regulate the rate at which the error term modifies it); and

an actuator control signal generator to generate the actuator control signal, wherein the actuator control signal is a function of a prior actuator position, the error term and the adaptation coefficient (column 5, lines 1-11, where the details are similar to column 4, lines 46-57).

Hajjar does not disclose wherein the baseline actuator positioning routine is configured to "apply actuator control signals to the actuator to step the actuator full a full range of focus; obtain a SUM signal at each step, the SUM signal being a sum of signals received from a plurality of focus sensors; identify one of the obtained SUM signals; and set the baseline actuator control signal according to an applied actuator control signal which resulted in the identified one of the obtained SUM signals."

Tsutsui discloses that it is necessary to set a focus offset signal in order to achieve an optimum focusing condition (column 1, lines 59-65). Tsutsui discloses that to set this focus offset, the focus offset positioning routine must be configured to:

apply actuator control signals to the actuator to step the actuator through a full range of focus (column 10, lines 34-50);

obtain a RF signal at each step(column 14, lines 25-45);

identify one of the obtained RF signals (column 10, lines 34-50); and

set the baseline actuator control signal according to an applied actuator control signal which resulted in the identified one of the obtained RF signals (column 14, lines 50-65: "an optimum point can be...set")

Therefore, it would have been obvious to one of ordinary skill in the art to include in Hajjar the configuration taught by Tsutsui, including all the steps listed above. The motivation would have been to achieve an optimum focusing condition, as taught by Tsutsui (Hajjar's apparatus requires focusing on the disc in order to obtain the values it uses in the feed forward signal; thus optimum focusing conditions are necessary for Hajjar's apparatus).

Hajjar in view of Tsutsui does not disclose:

That the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

Kusumoto discloses:

An RF signal wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors (paragraph 72).



It would have been obvious to one of ordinary skill in the art to include in Hajjar in view of Tsutsui wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

The rationale is as follows:

Tsutsui discloses measuring the RF signal but does not disclose how the RF signal is obtained. Obtaining the RF signal is necessary for implementing the system of Tsutsui, and therefore necessary to implement Hajjar in view of Tsutsui. Kusumoto discloses a means of obtaining an RF signal: it's obvious to combine these teachings in order to implement Tsutsui's system, because one of ordinary skill could have combined them with predictable results.

Regarding claim 4:

In Hajjar in view of Tsutsui, and further in view of Kusumoto, the error term generator is configured to calculate the error term for every new actuator control signal generated by the actuator control signal generator (Hajjar's apparatus always calculates uses the error term to generate the control signal).

Regarding claim 5:

In Hajjar in view of Tsutsui, and further in view of Kusumoto, the actuator control signal generator additionally comprises:

- a coefficient generator to generate coefficients as a function of inputs comprising the adaptation coefficient and the error term (Hajjar: column 4, lines 37-57); and

- a Fourier subroutine to generate the actuator control signal using the coefficients generated (Hajjar: column 45, lines 37-57).

Regarding claim 11:

In Hajjar in view of Tsutsui the baseline actuator control signal includes an AC component (it alternates based on the surface height deviations on the disk).

Regarding claims 14, 17, and 18:

A processor-readable medium comprising processor-executable instructions corresponding is inherent to Hajjar. Otherwise these claims are similar to claims 1, 4, and 5, and are rejected for the same reasons.

Regarding claim 23:

The instructions for setting the baseline actuator control signal comprises instructions for setting different baseline actuator control signals for different sectors of the disk (it is different wherever there is a surface deviation, so even though Hajjar does not specifically measure sector-by-sector the signal is inherently different in different sectors of the disk).

Regarding claims 25, 28, and 29:

These are method claims corresponding to the earlier system claims and are met when the system operates.

Regarding claims 35, 38, 39, and 43:

They are similar to the earlier claims, and are rejected for the same reasons.

Claims 2, 3, 15, 16, 26, 27, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajjar in view of Tsutsui, and further in view of Kusumoto, as applied to the claims above, and further in view of Shoda et al. (US 5,477,333).

Regarding claim 2:

Hajjar in view of Tsutsui, and further in view of Kusumoto, discloses a system as discussed above.

Hajjar in view of Tsutsui does not disclose "wherein the error term generator is configured to generate the error term using a FES signal as input."

Hajjar in view of Tsutsui, and further in view of Kusumoto, is trying to detect the surface height deviations of the disk (Hajjar: column 2, lines 10-11). Hajjar, and further in view of Kusumoto, does so by focusing the lens and then detecting the lens position, which is parallel to the disk. However, directly detecting the surface height deviations would be more efficient.

Shoda discloses a method of detecting the distance between a lens and a measured surface (abstract). The method involves detecting a focus error signal "which represents a difference between a distance of the object lens from the measured surface" (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hajjar in view of Tsutsui, and further in view of Kusumoto, as taught by Shoda to replace the focusing and lens position detecting steps of Hajjar with directly measuring the FES signal. The motivation would have been to simplify the measuring process, which would make it both more reliable and more efficient.

In Hajjar in view of Tsutsui, and further in view of Kusumoto, as modified by Shoda, the error term generator would be configured to generate the error term using a FES signal as input.

Regarding claim 3:

Hajjar discloses sampling the position sensor signal and using an A-to-D converter to produce the error term (column 5, lines 29-37); in Hajjar in view of Tsutsui, and further in view of Kusumoto, and further in view of Shoda, then, the error term generator is configured to sample the FES signal and use an A-to-D converter to produce the error term.

Regarding claims 15 and 16:

Hajjar in view of Tsutsui, and further in view of Kusumoto, and further in view of Shoda inherently includes a processor-readable medium; all other elements of these claims have been discussed.

Regarding claims 26, 27, 36, and 37, they are similar to claims 2 and 3 and rejected for the same reasons.

Claims 1, 4, 9, 14, 17, 25, 28, 34, 35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faucett (US 2002/0089906 A1) in view of Tsutsui, and further in view of Kusumoto.

Regarding claim 1:

Faucett discloses a system for establishing a baseline signal for application to an actuator within an optical disk drive to focus optics on an optical disk within the optical disk drive (paragraph 7), the system comprising:

an error term generator configured to generate an error term (paragraph 15);

an adaptation coefficient configured to regulate a rate at which the error term modifies an actuator control signal (there are several: for example term A in equation 3); and

an actuator control signal generator to generate the actuator control signal, wherein the actuator control signal is a function of a prior actuator position, the error term and the adaptation coefficient (equation 3).

Faucett does not disclose wherein the baseline actuator positioning routine is configured to "apply actuator control signals to the actuator to step the actuator full a full range of focus; obtain a SUM signal at each step, the SUM signal being a sum of signals received from a plurality of focus sensors; identify one of the obtained SUM signals; and set the baseline actuator control signal according to an applied actuator control signal which resulted in the identified one of the obtained SUM signals."

Tsutsui discloses that it is necessary to set a focus offset signal in order to achieve an optimum focusing condition (column 1, lines 59-65). Tsutsui discloses that to set this focus offset, the focus offset positioning routine must be configured to:

apply actuator control signals to the actuator to step the actuator through a full range of focus (column 10, lines 34-50);

obtain a RF signal at each step (column 14, lines 25-45);

identify one of the obtained RF signals (column 10, lines 34-50); and

set the baseline actuator control signal according to an applied actuator control signal which resulted in the identified one of the obtained RF signals (column 14, lines 50-65: "an optimum point can be...set")

Therefore, it would have been obvious to one of ordinary skill in the art to include in Faucett the configuration taught by Tsutsui, including all the steps listed above. The motivation would have been to achieve an optimum focusing condition, as taught by Tsutsui.

Faucett in view of Tsutsui does not disclose:

wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

Kusumoto discloses:

An RF signal wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors (paragraph 72).

It would have been obvious to one of ordinary skill in the art to include in Hajjar in view of Tsutsui wherein the RF signal is a SUM signal, the SUM signal being a sum of signals received from a plurality of focus sensors.

The rationale is as follows:

Tsutsui discloses measuring the RF signal but does not disclose how the RF signal is obtained. Obtaining the RF signal is necessary for implementing the system of Tsutsui, and therefore necessary to implement Faucett in view of Tsutsui. Kusumoto discloses a means of obtaining an RF signal: it's obvious to combine these teachings in order to implement Tsutsui's system, because one of ordinary skill could have combined them with predictable results.

Regarding claim 4:

In Faucett in view of Tsutsui, and further in view of Kusumoto, the error term generator is configured to calculate the error term for every new actuator control signal generated by the actuator control signal generator (obvious from Faucett equation 3).

Regarding claim 9:

In Faucett in view of Tsutsui, and further in view of Kusumoto, the actuator control signal generator is configured, if an angular disk speed of the optical disk drive is sufficiently high, to shift a phase of terms within the actuator control signal to reduce actuator resonance (Faucett paragraph 28; the response time of the compensator can be improved – presumably necessary at a higher speed – but it shifts the phase of the actuator signal).

Regarding claims 14, 17, 25, 28, 34, 35, and 38:

They are similar to the earlier claims, and are rejected for the same reasons.

#### **(10) Response to Argument**

Regarding the rejection of claims 45-48 as unpatentable over Tsutsui in view of Kusumoto:

Applicant starts, on pages 5-6 of the Appeal Brief, by summing up the claims and the arguments in the previous Office Actions.

Of particular note here is that the Examiner had previously relied upon the Applicant's specification to define the phrase "full range of focus." All of Applicant's arguments are centered on the meaning of this phrase.

In the previous Office Action, the Examiner noted that Applicant's specification, on page 8, lines 4-7, discloses "The baseline actuator positioning routine 210 is configured to move the optics 114 through a full range of focus, i.e. from focusing too near to focusing too far away." Since Tsutsui discloses moving the optics from focusing too near to focusing too far away, based on Applicant's own definition, the Examiner argued that Tsutsui disclosed moving them through "a full range of focus."

Beginning on page 7, Applicant presents their first argument. Applicant argues that "the Examiner's interpretation of the phrase 'full range of focus' is unreasonably broad." Applicant makes a number of arguments to support this point. Each will be addressed in turn.

In the first paragraph of page 7:

Applicant argues that the "example" in the specification "simply explains a possible direction of the focus shift," and shouldn't be taken to limit the meaning of the term "full range of focus" to "a subset of the true full range of focus."

This argument is not persuasive. The statement in the specification: "a full range of focus, i.e. from focusing too near to focusing too far away" is a definition of the phrase. The Latin abbreviation "i.e." means "that is" or "in other words," and so the specification has stated that moving the optics through "a full range of focus" is identical to moving them from "focusing too near to focusing too far away." Tsutsui meets this definition.

From the argument in this paragraph, Applicant apparently believes the phrase "through a full range of focus" should be defined as "from one extremity of the entire



range that the optics can move to the other extremity of the entire range that the optics can move," but this definition is much narrower than the definition provided in the specification. There is no basis in the specification or in the plain meaning of the words to narrow the definition of this phrase as Applicant would like.

Starting in the second paragraph of page 7:

Applicant quotes Merriam-Webster's definition of the words "full" to mean "complete..." and "range" to mean "space or extent" to further support their desired interpretation of the phrase's meaning.

Even relying upon the definitions Applicant has provided, the Examiner's interpretation of the phrase is reasonable. If the phrase "a full range of focus" means "a complete extent of focus," Tsutsui still meets the meaning; since Tsutsui discloses moving from being unfocused in one direction, to being unfocused in the other, and passing through a focused state in the middle, Tsutsui moves through the complete extent "of focus," i.e., through the complete extent of possible focused states (focused too near, focused properly, and focused too far). Tsutsui certainly moves through a full range of focus *for that layer of the disc*.

Additionally, there are other meanings of the word "full." For example, Merriam-Webster's first definition, which Applicant neglected to quote, is "containing as much or as many as is possible **or normal**." This indicates that full does not have to mean covering every possible limit, but only the limits that an ordinary person would consider normal: Tsutsui's focus stepping operation falls into this definition, because it covers the

entire range that one of ordinary skill would reasonably expect the focused point to fall into.

Starting in the third paragraph of page 7:

Applicant states that "the Specification provides two examples that distinguish between stepping the actuator between a full range of focus and a subset of that full range," and quotes two paragraphs of the specification. Applicant argues that the first paragraph discloses stepping through a "limited subset" of focal points and therefore the second paragraph must be referring the entire range the actuator can move.

However, these parts of the specification do not support Applicant's argument. The first paragraph discloses an alternate method where the optics are focused directly on the proper layer without moving through any kind of range of focus, so it is entirely unrelated to the claimed subject matter. There's nothing in this section that explicitly defines a "full range of focus" in the way Applicant insists it must be defined: indeed, the only definition offered here is that it is "from focusing too near to focusing too far away," which Tsutsui definitely meets.

Applicant then summarizes Tsutsui and presents their next argument on page 9:

Applicant argues that Tsutsui steps through "much less than a full range of focus" (emphasis in original). Applicant's argument is essentially that because Tsutsui's focus search operation only takes place around one layer of the disc, and the optics are capable of moving from layer to layer, the focus search operation doesn't move through the entirety of the range that the optics are capable of moving.

That is not what is being claimed. The claims are to moving the optics through "a full range of focus," and Applicant's specification itself defines that as moving "from focusing too near to focusing too far away." When finding the proper focus position for a given layer, Tsutsui focuses too near it and moves through a series of offsets until it is focused too far away, choosing as the optimum point the maximum value in the middle.

Note that Applicant's own specification discloses essentially the same operation as Tsutsui. Nowhere in Applicant's specification does it state that the optics move from the first extreme point they are capable of reaching to the other extreme point they can reach: it just discloses moving from focusing too near to focusing too far around one layer of the disc: i.e., the label layer.

Applicant's next argument begins on page 10:

Applicant argues that Tsutsui in view of Kusumoto "does not teach obtaining signals of any particular type at each step" (emphasis in original).

It appears that Applicant is arguing that since Tsutsui doesn't disclose moving through "a full range of focus," it can't possibly disclose obtaining a signal at each step in the full range of focus.

Tsutsui definitely discloses stepping through a range of focus, and obtaining a signal at each step in the range: this is shown in, for example, Fig. 7. Therefore this argument is really based on Applicant's previous arguments about the "full" range of focus, and is not persuasive for the same reasons that they were not.

Applicant next applies the same set of arguments to claims 46, 47, and 48. The arguments are not persuasive with regards to these claims either.

Regarding the rejection of claim 13 as unpatentable over Tsutsui in view of Kusumoto, and further in view of Fennema:

Applicant only argues that this claim is allowable based upon its dependence on claim 45. Since Applicant's arguments were not persuasive with regards to those claims, this argument is not persuasive.

Regarding the rejection of claims 1, 4, 5, 14, 17, 18, 23, 25, 28, 29, 35, 38, 39, and 43 as unpatentable over Hajjar in view of Tsutsui, and further in view of Kusumoto:

Applicant again only argues based on the dependence of these claims on earlier claims. Even though these claims are dependent on claim 45, etc., these claims have actually been rejected under a separate ground of rejection from the earlier rejections, but since Tsutsui is relied upon in this rejection also, Applicant presumably means to argue that their earlier arguments apply to these claims' rejection as well. However, they are no more persuasive here.

Regarding the rejection of claims 2, 3, 15, 16, 27, 36, and 37 over Hajjar in view of Tsutsui, and further in view of Kusomoto, and further in view of Shoda:

Again, Applicant only cites their dependence from earlier claims. Applicant's earlier arguments are no more persuasive with regards to these claims.

Regarding the rejection of claims 1, 4, 9, 14, 17, 25, 28, 34, 35, and 38 as unpatentable over Faucett in view of Tsutsui, and further in view of Kusomoto:

Again, Applicant only cites their dependence from earlier claims: again, this is actually a separate ground of rejection, but Applicant presumably means that their earlier arguments with regards to Tsutsui still apply. They are no more persuasive with regards to these claims.

In conclusion:

All of Applicant's arguments center on what it means to move an actuator through "a full range of focus" (claim 45). Applicant argues that this phrase can only mean moving from the first furthestmost extreme limit the actuator can reach to the other furthestmost extreme limit the actuator can reach. While this may be one possible meaning for the phrase, it is not unreasonable for the Examiner to consider Tsutsui's operation of moving through a full range of focus around one layer of the disc to be moving it through "a full range of focus," especially given that Applicant's own specification defines the phrase as merely moving it from "focusing too near to focusing too far away." Therefore the rejections involving Tsutsui meet a reasonable interpretation of the claim language, and Applicant's argument is without merit.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 2627

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

CRL 5/20/08

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